International Journal of Herbal Medicine
Available online at www.florajournal.com

E-ISSN: 2321-2187
P-ISSN: 2394-0514
www.florajournal.com
IJHM 2021; 9(4): 106-111
Received: 13-05-2021
Accepted: 15-06-2021

Reesha Ahmed
Drug Standardization Research Institute, PCIM&H Campus, Kamala Nehru Nagar, Ghaziabad, Uttar Pradesh, India

Anees Ahmed
Drug Standardization Research Institute, PCIM&H Campus, Kamala Nehru Nagar, Ghaziabad, Uttar Pradesh, India

Shoeb Ahmed Ansari
Drug Standardization Research Institute, PCIM&H Campus, Kamala Nehru Nagar, Ghaziabad, Uttar Pradesh, India

Mohd Wasim Ahmed
Drug Standardization Research Institute, PCIM&H Campus, Kamala Nehru Nagar, Ghaziabad, Uttar Pradesh, India

Asma Sattar Khan
Drug Standardization Research Institute, PCIM&H Campus, Kamala Nehru Nagar, Ghaziabad, Uttar Pradesh, India

Corresponding Author:
Reesha Ahmed
Drug Standardization Research Institute, PCIM&H Campus, Kamala Nehru Nagar, Ghaziabad, Uttar Pradesh, India

Darchini (Cinnamon): A versatile drug in Unani system of medicine: An extensive review

Reesha Ahmed, Anees Ahmed, Shoeb Ahmed Ansari, Mohd Wasim Ahmed and Asma Sattar Khan

Abstract
Darchini (Cinnamon) is used from ancient times as a traditional medicine due to its tremendous medicinal properties. It is obtained from the inner bark of various species of evergreen trees of *Cinnamomum* genus. The drug belongs to Lauraceae Family. The most popular species of cinnamon are found in Sri Lanka, China and India however it is grown throughout Asia, Europe and North America. It has multiple uses from as anaromatic spice or a flavouring additive to far more diverse medicinal uses. It contains numerous organic components like essential oil, eugenol, glycosides, tannins, resins, flavonols along with many inorganic compounds such as iron, magnesium, calcium, sodium, potassium, chloride and phosphate. In Unani system of medicine, Darchini is not only used as a single drug but also remains an integral part of several compound formulations. It is vastly used for the treatment of a number of diseases such as *Zoaf-e-ishteha* (Anorexia), *Qai* (Vomiting), *Is'haal* (Diarrhoea), *Istarkha-e-ratoobi* (Dropsy), Iltehaab (Inflammation), Zaheer (Dysentery), *Kasrat-e-haiz*(Menorrhagia), *Matli* (Nausea) etc. Moreover, it possesses many pharmacological activities such ascardio-protective, anti-bacterial, anti-oxidant andanti-inflammatory. The present study is an attempt to review comprehensively various medicinal properties of Darchini and its pharmacological activities in the light of Unani classical literature.

Keywords: cinnamon, disease, Muqawwi, eugenol, cinnamaldehyde

1. Introduction
Darchini (Cinnamon) is one of the oldest well-known drugs. Chinese literature reveals that the drug has a history of medicinal uses as old as 4000 years. It is a small evergreen tropical tree belonging to the Lauraceae family. Besides its various applications in traditional medicines, cinnamon barks and leaves are extensively used as aromatic condiment and flavouring agent in wide variety of cuisines. Essential oil extracted from its bark is rich in trans-cinnamaldehyde which has antimicrobial effects against animal and plant pathogens. The essential oil has also a number of applications in the food and beverage industries [1].

In Unani system of medicine different parts of the Darchini plant or sometimes the whole plant is used for medicinal purposes [2]. Several compound Unani formulations contain Darchini as one of the important active ingredients.

Many species of cinnamon are available in the market such as *Cinnamomum zeylanicum* (Ceylon cinnamon/ True cinnamon/ Mexican cinnamon), *C. aromaticum* (Chinese cinnamon/ Cassia cinnamon), *C. burmanni* (Indonesian cinnamon) and *C. loureiroi* (Vietnamese cinnamon).Ceylon cinnamon (*Cinnamomum zeylanicum* Blume) is considered the best species among all. It is native of Sri Lanka having light yellowish brown colour with slightly bitter but strong pungent taste [2, 3].

Darchini is obtained from the plant in such a way that they develop slender shoots with little or no astringent cork. It is accomplished by cutting the crown of the tree down from stools. The latter send forth adventitious shoots which lengthen at the rate of about a meter a year. Thereafter, the shoots are reached up to 1 to 2 m long; they are cut down during the rainy season and deprived of leaves and small twigs. After every 2-3 years, a new shoot crop is harvested. The bark is then obtained by making two incisions lengthwise down the shoot with cross incisions after every 2 feet in order to remove it with the help of sharp knife. Thereafter, it is allowed to ferment for some days. After fermentation it is sufficiently soft for removing its outer layer. It is done by scraping the outer bark as far as pericyclic fibres. Double quills are then formed by placing congeries of from 7-12 strips together and allowing to dry successively in the shade and sun light [4, 5].

2. Vernacular names

Table 1: Vernacular names

Arabic	Darasini, Darchini, Darsini, Qirfahesailaniyah, Kirpa
Burma	Timbotikyobo, Hmanthin, Lulingyaw, Simbosikiyabo, Thithyabo, Theet Kyabah
Bombay	Taj, Dalchini, Kalphah, Bojevar,Ohez, Tikhi,Dalachini, Taja
Bengal	Dalchini, Daruchini, Qalami-darchini, Dalachini, Taja
Chinese	Yuh, Juh, Kevei
Canarese	Lavanga-patte, Daruchini, Dalchini, Dalachini, Kaduvudalchini, Lavangachakke, Lavangapatte, Nisane, Nisani, Nisne, Tejadalchini
Ceylon	Kuruva
Deccan	Dalchini, Qalamidarchini
Dutch	Kaneel, Kulmiedarchinie, Caneel
English	Chinese Cassia, Cinnamon, Cinnamon Bark, True Cinnamon
French	Cannelle, Bois de cannelle, Cannelier, Laurier cannelier
Greek	Kinnamomon
German	Zimmt, Ceylonzimt, Kanohl
Gujarati	Dalchini, Darchini, Taj,
Hindi	Darchini, Daruchini, Dalchini, Qalamidarchini, Moti darchini, Tvak, Guda tvach, Tvaksara, Tvaksvadvi
Italian	Cannella, Cannella de Ceylon, Cannella regina
Kashmiri	Daruchini, Dalchini
Latin	Cinnamomi Cortex,
Malayalam	Lavanga-pattai, Lowangapattai, Kulit-manis, Ilavannam, Cheriyilaivannam, Erikkolam, Etuna, Ilavangam,Karun,Varanam, Kaimanis, Katukarua
Marathi	Dalchini, Darachini
Punjabi	Darchini, Kirra, Dalchini, Daruchini, Kirfa
Persian	Saila-Myah, Darchini, Darchinisailaniyah, Talikhahe,
Sanskrit	Tamalapatra, Gudatvak, Thwak, Varangam, Thracham, Bahugandha, Balya, Bhringa, Bijjula, Chocha, Chola, Darusita, Gudatvacha, Hridya,
Sinhalese	Kira phah, Gudat vaka,Kurundu, Kurundo, Rassukurundu
Tamil	Lavanga-pattai, Cannalavangapattai, Ilayangan, Lowangapattai
Telugu	Lavanga-pattai, Darchini, Lowangapattai, Lavangamu, Lavangapatta, Sannalavanga, Sanalingaputta, Sanna, Lavanga-patta,
Unani	Kinnamomon
Urdu	Darchini

Fig 1: Darchini (*Cinnamomum zeylanicum* Blume)

3. Morphology (Mahiyat)

Darchini (*Cinnamomum zeylanicum* Blume) is an evergreen tree reached up to 8m height. Its bark is thick and smooth withlight yellowish brown in colour and having compressed twigs. The young part of this plant isglabrous but buds aresilky in nature. The leaves are thick, leathery, opposite or sub opposite (sometime alternate), hand and coriaceous, size about 7.5-20 by 3.8-7.5 cm and ovate or ovate to lanceolate in shape, sub-acute or shortly acuminate, upper surface of leave is glabrous and shining while lower surface is in pale colour, base of leave is acute or rounded; main nerves is 3-5 in number from the base, strong and fine reticulate venation between them; petioles are 1.3-2.5 cm long, flattened at the above[6,7]. This plant has numerous flowers, silky to pubescent lax and panicles are longer than the leaves; peduncles are long, clustered, smooth or pubescent; pedicles are long in length. However, size of perianth 5-6 mm, while tube 2.5 mm in length. The segments are pubescent on both sides, oblong or slightly obovate but usually obtuse. Fruitsare1.3-1.7 cm in length, oblong or ovoid to oblong in shape, minutely apiculate, dry or somewhat fleshy in texture and coloured is dark purple, surrounded by the enlarged campanulate perianth which has a diameter about 8 mm [6].

4. Geographical distribution

Darchiniis indigenous to Sri Lanka, China and India [8]. However, it is cultivated in different parts of the world like Myanmar, Indonesia and North America [6, 9].

5. Unani literature based description

Theterm cinnamon was coined from the Greek word Lexicon or Kinnamomon [8]. According to Discoridos (circa 1 century AD) the best drug variety has black, brownish or red colour. It has little sweet, salty and strong pungent taste. It is not much fragile and its odour dominates all other odour [11, 12].Due to its fragrance, it is mainly used in the aroma and essence industries and can be incorporated into different varieties of foodstuffs, perfumes, and medicinal products [10].

6. Part used (*Hisas-E- Mustamalah*)

Inner portion of bark of the shoots in dried state, obtained from various species of plants of *Cinnamomum* genus. Apart from bark, leaves, stem and essential oil are also used for various applications [13, 14].

There are several oils of cinnamon the chief commercial varieties of which are the Oil of Chinese Cinnamon (Oleum Cinnamomi Cassiae) and the Oil of Ceylon Cinnamon (Oleum Cinnamomi Zeylanici). The latter has the finest aroma of all

cinnamon oils. The colour of oil of cinnamon is pale-yellow or wine-yellow which slowly changes to cherry-red. Its taste is at first sweetish afterward burning and aromatic. It is readily soluble in alcohol. Its specific gravity varies from 1.024 to 1.040. The oil contains 65-75% of *cinnamic aldehyde*, and about 4-8% of eugenol. This oil is often adulterated with the oil from the leaves, which is frequently distilled along with the bark; the oil of the leaves (1.8%) is characterized by a much higher percentage of its eugenol contents (70-90%), and consequently by a higher specific gravity (1.044 to 1.065) [15].

7. Temperament (*Mizaj*)

Temperament (Mizaj) is one of the basic principles of Ilmul-Advia (pharmacology) in Unani system of medicine. The Mizaj of drug is expressed in order to signify particular qualities of the drug. Darchini has hot and dry temperament. Some of Unani literature have mentioned it to be of Hot 2^0 and Dry 2^0 temperament [12, 16, 17, 18, 19, 20, 21, 22] while the others have mentioned that it has Hot 3^0 and Dry 3^0 temperament [13, 29].

8. Pharmacological action (*AF'AL*)

Table 2: Pharmacological action (*AF'AL*)

S. No.	Action		References
	Unani terms	Common terms	
1.	*Muqawwi-e-jigar*	Liver tonic	24
2.	*Kasir-e-Riyah*	Carminative	6,7,9,20,25,26,27
3.	*Dafe Tashannuj*	Antispasmodic	9, 25
4.	*Mushtahi*	Appetizer	27
5.	*Moharrik*	Stimulant	6,8,9,13,25,29
6.	*Habis-ud-dam*	Haemostatic	8,25
7.	*Qabiz*	Astringent	6,8,9,25,26,27, 28,30, 31
8	*Dafe Ta'ffun*	Antiseptic	13,30
9.	*Muqawwi-e-bah*	Aphrodisiac	6,13,25,28
10.	*Muharrik-e-bah*	Sex Stimulant	13,21,30
11.	*Qatil-e-kirm*	Anthelminthic	6
12.	*Muqawwi*	Tonic	6,8
13.	*Mukhrij*	Expectorant	8
14.	*Muqawwi-e-Meda*	Stomachic	7,8,13,21,25,26,30,31
15.	*Mufatteh*	Deobstruent	8,13,21,24,32,33
16.	*Muqawwi-e-qalb*	Cardio tonic	24,32
17.	*Muddir-e-Baul*	Diuretic	8,24,25,30,33
18.	*Muddir-e-Haiz*	Emmenagogue	6,13,21,24,29,33
19.	*Mulattif*	Demulcent	13,25,29
20.	*Musakkin*	Sedative	20
21.	*Jazib*	Absorbent	13
22.	*Mufarreh-e-Qalb*	Exhilarant	24
23.	*Muqawwi-e-Aza-e-Raeesa*	Tonic for vital organs	13
24.	*Muqawwi-e-asaab*	Nervine tonic	20
25.	*Daf-e-jaraseem*	Germicidal	7,9,25
26.	*Daf-e-aatsh*	Quench the thirst	34
27.	*Daf-e-Jaraseem*	Bactericide	34
28.	*Musaffi-e- dam*	Blood purifier	8
29.	*Mufarreh-e-qalbwadimag*	Exhilarant	32
30.	*Muhallil*	Resolvent	21
31.	*Daf-e-humma*	Anti-pyretic	36
32.	*Daf-e-ishaal*	Anti-diarrhoea	36

9. Therapeutic uses (*Mehle Istemalat*)

Table 3: Therapeutic uses (*Mehle Istemalat*)

S. No.	Uses		References
	Unani terms	Common terms	
1.	*Zof-e-Meda*	Weakness of stomach	12
2.	*Qai*	Vomiting	6,7,8,9,25
3.	*Iltehaab*	Inflammation	6
4.	*Is'haal*	Diarrhoea	6,7,9,25,36
5.	*Istarkha-e-ratoobi*	Dropsy	20
6.	*Zaheer*	Dysentery	8,25
7.	*Kasrat-e-haiz*	Menorrhagia	25
8.	*Matli*	Nausea	7,9,25
9.	*Zoaf-e-ishteha*	Anorexia	6
10.	*Asbidard*	Neuralgia	25,26
11.	*Suda*	Headache	6,13,25
12.	*Suzak*	Gonorrhoea	9,25
13.	*Humma-e-taifudiya*	Typhoid fever	8,9
14.	*Waja-ul-mufasil*	Rheumatic pain	25

15.	*Waja-ul-asnaan*	Toothache	6,25,26
16.	*Falij-e-lissa*	Paralysis of tongue	6,25
17.	*Qurwmai*	Hydrocele	6
18.	*Bwaseer*	Piles	6
19.	*Sual*	Cough	13,25,27,36,37
20	*Shobat-ul-riya*	Bronchitis	6
21.	*Kharish*	Itching	6
22.	*Zof*	Debility	8
23.	*Kulanj*	Colic	8
24.	*Junoon*	Mania	21,27,33
25.	*Istisqa*	Ascites	24,32,33
26.	*Amraz-e-qalbwamiqad*	Diseases of the heart & rectum	6
27.	*Amraz-e-baul*	Urinary diseases	6
28.	*Idrar-e-Haiz*	Inducing Menstruation	13
29.	*Amraz-e-sadar wa riya*	Respiratory Disease	20
30.	*Nafakh*	Flatulence	6,7,8,9
31.	*Waja-ul-ama*	Enteralgia	9,25
32.	*Fakhr-ul-dam*	Anaemia	29
33.	*Bahaq*	Ptyriasis	29
34.	*Zof-e-Bah*	Sexual debility	29
35.	*Zeeq-un-nafas*	Asthma	8,13,29
36.	*Ehtebas-e-Baul*	Anuria	29
37.	*Kalaf*	Melisma	31
38.	*Rasha*	Tremor	21,27,32
39	*Khafqaan*	Palpitation	21,27

10. Adverse effects (*Muzir*)

Dalchini generally doesn't cause any side effects. But its excessive use can cause mouth sores, headache and urinary bladder problems [17, 18, 27]. Cassia cinnamon contains coumarins which can be harmful to liver but the amount which one usually takes is so small that it doesn't create any harmful effects. However, some people may be allergic to it.

11. Phytochemical constituents

Cinnamon plant has many organic components like essential oil, eugenol, glycosides, phenolic compounds, tannins, resins and flavonols.Beside this it has cinnamic acid, resin, starch, tannin, mucilage, sugar etc.It also contains numerous inorganic compounds like iron, magnesium, calcium, sodium, potassium, chloride and phosphate [13].Several other compounds like cinnamic aldehyde, cinnamyl acetate, hydro-carbon, phellandrene, pinene, linalool, caryophyllene and eugenol are obtained from different parts of cinnamon plant. Different species of cinnamon contain organic compounds in varied ranges i.e. aldehydes (55-65%), eugenol (70-80%) and cinnamic aldehyde (75%) (9,10).The oil contains 90% of cinnamaldehyde, small quantity of cinnamic acid, cinnamyl acetate and eugenol [7].

12. Important formulations (*Mashhoor Murakkab*)

Darchini is used in the preparation of a number of compound Unani formulations such as Jawarish Jalinoos, Jawarish Bisbasa, Jawarish Zanjabeel, Jawarish Amla Ambari, Jawarish-ood-Sheerin, Majoon Suparipak, Majoon Ushba, Arq-e-Chobchini [13, 29].

13. Pharmacological activities

13.1Anti-diabetic activity

Darchini contains Methyl hydroxychalcone a purified polymer, polymer of polyphenol type-A polymers and naphthalene methyl ester the derivatives of hydroxyl cinnamic acid which are responsible for the anti-diabetic property of the drug [38, 39]. Consumption of cinnamon for short term in patients of pre-diabetes and diabetes mellitus-type 2 are found to be associated with the reduction in systolic blood pressure and diastolic blood pressure [40]. Beside this, one more studied concluded that the extract of *C. zeylanicum* lowers blood glucose levels in diabetic mothers and their foetuses to prevent damage in their cerebrum of brain [41].

13.2 Cardio-protective activity

The ethanol extract of cinnamon is effective in producing hypotensive responses in normotensive rat and salt-loaded hypertensive rat [42].

13.3 Antibacterial activity

The ethanolic extract of Darchini possesses antibacterial activity against methicillin resistant *Staphylococcus aureus* (MRSA). In the treatment of such infection, extract of Darchini could have valuable effect and may also help to achieve the potential antimicrobial agents against MRSA bacteria [43].

13.4Antioxidant activity

The methanolic extract of Darchini contains a number of antioxidant compounds which can effectively scavenge reactive oxygen species including superoxide anions and hydroxyl radicals as well as other free radicals under *in vitro* conditions [44].

13.5 Anti-Inflammatory activities

Cinnamaldehyde inhibits production of nitric oxide which is implicated in the inflammatory disease process and also demonstration COX-2 (cyclooxygenase-2) inhibition which catalysed prostaglandin E2 biosynthesis.About 70% of ethanol extract of cinnamon was effective on acute inflammation in mice [45].

13.6 Neuroprotective activity

Cinnamophilin (80 mg/kg) provides defence against ischemic damage of brain of rats at interval of 2, 4, and 6 h, after injected. Furthermore, it has shown 34-43% effect on prune brain infarction and also improves neurobehavioral outcomes [46]. *A* aqueous extract of cinnamon was found to reduce the formation of toxic amyloid polypeptide oligomers and also

prevents the toxicity of amyloid polypeptide oligomers on neuronal pheochromocytoma cells [47].

13.7 Anticancer activity

The pharmacological studies have shown that aqueous extract of cinnamon is a potent natural inhibitor of mitogen-activated protein kinase, VEGFR2 kinase, and Stat3-mediated signalling pathway in cells of endothelial. Hence, this can be used in prevention as well as treatment of cancer patients [48].

14. Conclusion

In the present study, the comprehensive survey of the literature revealed that Darchini (Cinnamon) has magnificent therapeutic applications. Apart from its use as fragrant spice, it is widely used as traditional medicine in numerous cultures throughout the world. From the findings of several studies, it can be concluded that in Unani system of medicine, administration of cinnamon in various forms has imperative effects in the treatment of diabetes, high blood pressure, coronary artery, cancer and the diseases associated with nervous system.

15. Acknowledgment

The authors are extremely thankful to the Director-General, Central Council for Research in Unani Medicine (CCRUM), New Delhi for his continuous encouragement and providing necessary facilities for the study.

16. References

1. Wong YC, Ahmad-Mudzaqqir MY, Wan-Nu WA. Extraction of Essential Oil from Cinnamon (*Cinnamomum zeylanicum*), Oriental Journal of Chemistry 2014;30(1):37-47.
2. Vangalapati M, Satya NS, Prakash DVS, Avanigadda S. A review on pharmacological activities and clinical effects of *Cinnamon* sp. Research Journal of Pharmaceutical, Biological and Chemical Sciences 2012;3(1):653.
3. Dymock W, Warden CJH, Hooker D. Pharmacographic India, Kegan Paul, Trench, Trubner and Co. Ltd., London 1890;3:203.
4. Singh D. Unani Dravyagnue Darsh, Ayurvedic and Unani Tibb Academy, Uttar Pradesh 1974, 388.
5. Youngken HW. Natural drugs: morphological and taxonomic consideration, Ed. 2, Biotech Books, Delhi 2003, 251-252.
6. Kirtikar KR, Basu BD. Indian Medicinal Plants, Edn. 2, International Book Distributers, Dehradun 1996;3:2149.
7. Bhattacharjee SK. Hand Book of Medicinal Plants, Edn. 4, Pointed Publishers Jaipur 2004, 99.
8. Dey KL. The Indigenous Drugs of India, Edn. 2, Pama Primlne, The Chronic Botanica, New Delhi 1973, 83.
9. Khory RN, Katrak NN. Materia Medica of India and their Therapeutic, Neeraj Publishing House Delhi 1985, 527.
10. Shahabuddin M, Idris M, Tarannum. World Journal of Pharmaceutical Research 2017;6(05):1311-1329.
11. Kasim NN, Ismail SAS, Masdar ND, Ab-Hamid F, Nawawi WI. Extraction and potential of cinnamon essential oil towards repellency and insecticidal activity. International Journal of Scientific and Research Publications 2014, 4(7).
12. Patel DK, Prasad SK, Kumar R, Hemalatha S. An overview on antidiabetic medicinal plants having insulin mimetic property. Asian Pacific Journal of Tropical Biomedicine 2012, 320-330.
13. Anonymous. Standardization of Single Drugs of Unani Medicine, Part I, CCRUM, New Delhi 2006, 53-57.
14. Anonymous. Quality Standards of Indian Medicinal Plants, Medicinal Plants Unit, Indian Council of Medicine Research, New Delhi 2003;1:74-81.
15. Cinnamon Oil: Available at: https://www.henriettes-herb.com/eclectic/kings/cinnamomum_oleu.html (Accessed: July 5, 2021)
16. Hakeem HMA. Bustanul Mufridat Jadeed, Idara Kitab-ul-Shifa, New Delhi 2002, 266. Nadkarni AK. Indian Materia Medica, Edn.3, Popular Book Depot, Bombay, Dhootapapeshwar Prakashan Ltd. Panvel 1954;1:328.
17. Nabi MG. Makhzan-ul-Mufridatwa Murakkabat Azam Al-Maroof Khawasul Advia, CCRIM, New Delhi 2007, 125.
18. Riyazuddin S. Makhzan-mufridatwa Murakkabat maikhwasul Advia, Electri Abulalai Press, Agra 1888, 114.
19. Haleem HMA. Mufridate Azizi, CCRUM, New Delhi 2009, 50.
20. Ansari HJA. Taleem-ul-Advia, Yusuf Publication House, Lucknow 1930, 51.
21. Ayyub MM. Tarjum-e-Aqseerai (Share moajjiz), Munshi Naval Kishor, Lucknow 1907;1:681-82.
22. Ibn-e-Sina. Al-Qanun Fil-Tibb (English Translation), Book II, Jamia Hamdard, New Delhi 1998, 204.
23. Ibn-e-Rushd AWM. Kitab-ul-kulliyat (Urdu Translation), CCRUM, New Delhi 1987, 286.
24. Ibn-e-Hubal Bagdadi. Kitab-ul-Mukhtarat-e-fil-tib (Urdu Translation), CCRUM, New Delhi 2005;2:100.
25. Nadkarni AK. Indian Materia Medica, Edn. 3, Popular Book Depot, Bombay, Dhootapapeshwar Prakashan Ltd. Panvel 1954;1:328.
26. Chopra RN, Chopra KC, Kapoor LD. Indigenous Drugs of India, Edn. 2, UN Dhur and Sons Private Limited, Calcutta 2006, 126.
27. Evans WC. Trease and Evans Pharmacognosy, Edn. 16, WB Saunders Company Ltd., London 2009, 491.
28. Ghani HN. Khazayinul Advia, Idara Kitab-ul-Shifa, Daeya Gunj, New Delhi 2011, 682-684.
29. Ainslie W. Materia Indica, Inter nation Book Distribution, Rajpur Road, Dehradun 1979;1:72.
30. Anonymous. The Unani Pharmacopoeia of India, Govt. of India Ministry of Health, Manager of Publication, Delhi 2007;1:26-27.
31. Greenish HG. Materia Medica, Edn. 3, Scientific Publishers (India), Jodhpur 1999, 269.
32. Harvi MY. Bahr-ul-Jawahar, Matba Mehtabi Press, Delhi 1321, 102.
33. Alam HM. Makhzanul Mufridatmai Tashreeh ul Adviayaat, Malik Deen Mohd & Sons Publishers, Lahore 121.
34. Dayal KS. Vedic Nighantoo or Vedic Makhzanul Mufridat, Kutab Khana Anjuman, Taraqqi Urdu Bazar, Delhi 1993, 83.
35. Sharma R. Medicinal Plants of India- An Encyclopaedia, Daya Publishing House, Delhi 2003, 59-60.
36. Raza AK. Tazkeratul-Hind-al-maroof-ba-yadgare-Razai (Persion), Azam Stream Press. Govt. Educational Printers, Hydrabad 1358;1:403.
37. Khan A. Muheet-e-Azam (Urdu translation), CCRUM, New Delhi 2012;2:542-543.
38. Jarvill TKJ, Anderson RA, Graves DJ. A hydroxy chalcone derived from cinnamon functions as a mimetic

for insulin in 3T3-L1 adipocytes. Journal of the American College of Nutrition 2001;20(4):327-36.
39. Kim SH, Hyun SH, Choung SY. Anti-diabetic effect of cinnamon extract on blood glucose in db/db mice. Journal of Ethnopharmacology 2006;104(1-2):119-23.
40. Akilen R, Pimlott Z, Tsiami A, Robinson N. Effect of short-term administration of cinnamon on blood pressure in patients with pre diabetes and type 2 diabetes. Nutrition 2013;29(10):1192-96.
41. Hashemi SS, Rafati AR. Anti-diabetic effect of *Cinnamomum zeylanicum* extract in the cerebrum histomorphometry in old fetus diabetic rats. Der Pharma Chemica 2016;8(12):68-73.
42. Wansi SL, Nyadjeu P, Ngamga D, Mbuyo EPN, Nguelefack TB, Kamanyi A. Blood pressure lowering effect of the ethanol extract from the stem bark of *Cinnamomum zeylanicum* (lauraceae) in rats. Pharmacol online 2007;3:166-176.
43. Mandal S, DebMandal M, Saha K, Pal NK. *In vitro* antibacterial activity of three Indians pices against methicillin-resistant *staphylococcus aureus*. Oman Med J 2011;26:319-323.
44. Jakhetia V, Patel R, Khatri P, Pahuja N, Garg S, Pandey A *et al*. Cinnamon: apharmacological review. Journal of Advanced Scientific Research 2010;1(2):19-23.
45. Leena NK. Cinnamon and cassia. In: Parthasarthy VA, Chempakam B, Zacharia TJ (Eds), Chemistery of Spices, Cabi, Wallingford 2008;7:124-144.
46. Lee EJ, Chen HY, Hung YC. Therapeutic window for cinnamophilin following oxygen-glucose deprivation and transient focal cerebral ischemia. Experimental Neurology 2009;217(1):74-83.
47. Frydman MA, Levin A, Farfara D. Orally administrated cinnamon extract reduces β-amyloid oligomerization and corrects cognitive impairment in Alzheimer's disease animal models. PLoS One 2011;6 (1):e16564.
48. Lu J, Zhang K, Nam S, Anderson RA, Jove R, Wen W. Novel angiogenesis inhibitory activity in cinnamon extract blocks VEGFR2 kinase and downstream signalling. Carcinogenesis 2010;31(3):481-8.